

antennas having a communication distance that is limited in range. Some embodiments are configured to communicate in accordance with Wi-Fi, Bluetooth, Near Field Communications (NFC), Transmission Control Protocol (TCP), Internet Protocol (IP), High-Definition Multimedia Interface (HDMI), and/or other such communication protocols and the range of communication is consistent with these standards. In some embodiments, the communication distance and/or the distance between the power transfer antennas can be as little as 1.0 nm, and is typically less than 15 cm, and in some implementations, the distance is less than 40 mm, while in many embodiments, the distance is less than about 5 mm. Still further, some embodiments are configured such that the communication distance of communications antennas is often limited in range to approximately those distances for which wireless electrical power transfer can be achieved through the power transfer antenna of antenna system 116.

[0051] In step 414, one or more wireless coupling and/or communication parameters (referred to generally below as coupling parameters) are received and/or determined corresponding to antenna systems 116 and/or an association between two or more of the antenna system. Typically, the wireless coupling parameters correspond to antenna systems and/or their potential coupling, association, and/or communication with other antenna systems. Further, the wireless coupling parameters can include one or more parameters that can be used in configuring a plurality of antenna systems 116 to provide, establish, and/or maintain a network of the antenna systems allowing each antenna system to communicate with and/or implement a power transfer with one or more other antenna systems. The wireless coupling parameters can include substantially any relevant parameter that can be used in determining how to configure the network of the antenna system. For example, the wireless coupling parameters can include, but are not limited to, an identification of an antenna system, number of wireless communications antennas incorporated within an antenna system, number of power transfer antennas, positioning and/or orientation of communication and/or power antennas, communication protocols and/or methods supported, signal power and/or approximate wireless communication range or distance of each communications antenna and/or associated with each communication protocol supported, approximate wireless power transfer range of the power transfer antenna, an identification of one or more other antenna systems and/or communications antennas that are within wireless power transfer and/or wireless communication range of an antenna system, wireless signal strength between one or more other antenna systems and/or communications antennas that are within wireless power transfer and/or wireless communication range of an antenna system, wireless communication protocols and/or communication methods supported by another antenna system in communication with an antenna system, antenna positioning and/or orientation (e.g., orientation relative to a case or housing of the CE device, orientation relative to another antenna system, etc.) of the antenna systems, whether a CE device is connected to an external power source or operating over local power, battery storage levels, and other such parameters or combinations of such parameters. The wireless coupling parameters can be determined locally within an antenna system and/or received from a remote antenna system.

[0052] Many of the parameters and capabilities attempt to improve coupling and alignment and/or try to line up the available signals that can be communicated (e.g., signal provided by one CE device and able to be used by another CE device) with the available antenna connections between a source CE device and a destination CE device. For some types of signals, there may only be a subset of the available antenna connections that are capable of communicating that type of signal. In some cases, the available signals may outnumber the available one or more inputs or vice-versa. Further, some implementations may provide available signals that outnumber the capacity of the available antenna connections. In such a situation, a choice or election is made, in some embodiments, as to which signals will be communicated through the system and which signals will not be communicated. For example, negotiation between communicating antenna systems and/or CE devices can achieve the selection (e.g., based on priority of available signals, signal quality, or the like, or combinations thereof), a group controller may select, a user may select (e.g., through a user interface), and so forth.

[0053] In some embodiments, the determination of the wireless coupling parameters includes a discovery process that identifies the various antenna systems and the capabilities and/or functionality of the various antenna systems. The coupling parameters at least in part define the capabilities and/or functionality of the various antenna systems. In some embodiments, the coupling parameters are locally stored within a storage medium of an antenna system (or the CE device in which the antenna system is positioned), received from a remote antenna system, obtained from a remote source, determined based on an identification of a separate antenna system, and the like, or a combination of such methods.

[0054] The capabilities, functionality, identity, and other such information is often obtained through initial communications from one or more of the antenna systems and/or between antenna systems. For example, the antenna system may communicate (e.g., via a predefined communication protocol, power modulation, etc.) its own capabilities. In some instances, the antenna system transmits its capabilities to another antenna system as part of an initiation process, such as upon initially detecting the other antenna system.

[0055] In step 416, one or more wireless coupling configurations are determined corresponding to the plurality of antenna systems and based on the wireless coupling parameters. The wireless coupling configurations at least in part dictate which one or more of the plurality of antenna systems each antenna system is to directly communicate with and/or enable power transfer there between. Further, in some embodiments, the wireless coupling configurations designate communications methods and/or protocols to be used (e.g., Wi-Fi, Bluetooth, via wireless USB, wireless Ethernet, power modulation (e.g., backscatter modulation), radio-frequency identification (RFID) communications or other such NFC, optical communication, HDMI, and/or other such communication methods or combinations of such protocols), which communications antenna of a plurality of communications antennas of an antenna system is to be used, a desired positioning and/or positional orientation of antenna system 116 and/or the CE device (which is typically dependent on an orientation of another antenna system to be communicated with), signal strength information defining a signal strength to be used in wirelessly transmitting relative to one